Home-Screen: A Short Scale to Measure Fall Risk in the Home

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Sungwon Chang, B.Sc., M.Stats.

Abstract  Community nurses are often the health professionals with whom older Australians living at home have most contact. The home environment has been identified to have a number of hazards associated with falls in older people. The Home-screen scale was specifically designed as a nurse-administered instrument to identify environmental and behavioral risks that alert nurses to the need for action to reduce fall risks in the home. A 14-item scale was administered to 1,165 older people receiving community nursing services. Psychometric investigation confirmed a 10-item scale with construct validity and internal consistency (α = 0.86, n = 989), explaining 60% of the construct of home safety (safe home environment and safe home behaviors). In addition, differences in mean scores were found in clients able and unable to transfer independently (t = 4.5 [df = 323.1] p < 0.001 [Group 1: M = 82.14, SD = 15.56; Group 2: M = 75.54, SD = 20.83, n = 989]). Similarly, an association existed between clients with low scores on the Home-screen scale and the perceived need for home modification. A score of 74 on this scale has been identified as a critical point for potential client injury. The use of this scale, both as an initial screening instrument and as a monitoring tool for community nurses working with older people, is recommended.

Key words: community nursing, occupational therapy, falls.

INTRODUCTION

One in three older people living in the community will experience a fall this year (El-Faizy & Reinsch, 1994). An important area of risk for falls by older people is the home environment and the way in which older people use the home (Connell & Wolf, 1997; Josephson, Fabacher, & Rubenstein, 1991). This makes safety in the home a public health issue of national and international importance.

Falls represent a major cause of injury in older populations in the United States (Connell & Wolf, 1997). Similar patterns of morbidity and mortality exist in Australia (Australian Institute of Health and Welfare [AIHW] and Commonwealth Department of Health and Family Services [DHFS], 1997; McLean & Lord, 1996), Canada (Ploeg et al., 1994), and the United Kingdom (Donald & Bulpitt, 1999). Quality of life for older people is also affected by falls, through a subsequent fear of falling (McLean & Lord, 1996). Such fear of falling represents a major contributing factor to nursing home admissions (Tinetti & Williams, 1997).

Home modification and change in behavior when using the home are central strategies to prevent falls (Christenson, 1990a; National Health and Medical Research Council [NHMRC], 1993). Both strategies aim to make the home and home-related behavior safer by minimizing hazards and risk-taking.

Community nurses play a vital role in the early identifi-
cation of fall risk. This study sought to develop and test a short screening tool for community nurses to assess home safety by measuring features of the home environment and behaviors of the older person when using the home. With such information, community nurses will be able to reduce fall risk either through targeted nursing interventions or through referral to specialist home modification and home behavior services.

LITERATURE REVIEW

A fall has been defined as “an unintentional event where a person comes to be on the floor without the feet weight-bearing” (Reinsch, MacRae, Lachenbruch, & Tobis, 1992, p. 5). Falls are the result of a complex interaction between the older person (intrinsic factors) and the environment (extrinsic factors) and the behavior of older people. As Josephson et al. stated: “many falls attributed to accidents . . . stem from interactions between environmental hazards or hazardous activities and increased susceptibility to hazards from the accumulated effects of age and disease” (1991, pp. 709–710).

Intrinsic factors are age-related, and possibly disease-related changes that alter the person’s ability to negotiate the environment intrinsic factors. Intrinsic factors include health problems, such as altered physical functioning (Christenson, 1990a; Lange, 1996; Lord, Ward, William, & Anstey, 1994; Mann, Hurren, Charvat, & Tomita, 1996; O’Brien, Pickles, & Culham, 1998). Polypharmacy and medications such as hypnotics, sedatives, antihypertensives, and cardiovascular drugs, have also been implicated (Lange, 1996; Mann et al., 1996). Although programs to increase functionality, strength, and balance have met with varying success (Wolter & Studenski, 1996), most intrinsic factors “are multidimensional and not readily amenable to change” (Fortin, Yeaw, Campbell, & Jameson, 1998, p. 628). This has led to interest in intrinsic factors as possible targets for falls prevention.

Extrinsic factors are those things in the environment that are hazardous (Lange, 1996). The home environment is of particular interest for older people. A detailed report on the location of 242 falls emphasized that most falls occurred in the home (32.2%), surrounding transition area (16.1%), and outside (51.2%) (Reinsch et al., 1992). Environmental features such as poor lighting, slippery rugs, clutter, and handrails play a part in a third to half of falls by older people in homes (Hornbrook et al., 1994; Rodriguez, Sattin, Devito, Wingo, & the Study to Assess Falls Among the Elderly, 1991). Assistive devices also contribute to falls and include walkers (Fleming & Pendergast, 1993) and vision devices (Mann et al., 1996).

The behavior of the older person in the environment must also be considered. It has been found that older people may engage in particular behaviors that increase the risk of a fall (Connell & Wolf, 1997; Ploeg et al., 1994; Reinsch et al., 1992). These may be habitual or inappropriate behaviors (Connell & Wolf, 1997), including rushing to get the door, or getting up to go to the toilet at night without adequate lighting.

Falls prevention strategies need to target these three areas of risk: intrinsic factors, extrinsic factors, and the behavior of individuals as they engage with the environment. As intrinsic factors have been identified as particularly difficult to address (Fortin et al., 1998), the home environment has been suggested to be a promising area of intervention and prevention for older people. There is some evidence that management of extrinsic factors such as home assessment and modification for safety can reduce falls in older people (Norton, Campbell, Lee-Joe, Robinson, & Butler, 1997; Ray et al., 1997). A recent randomized control trial revealed that detailed home assessment and intervention by an occupational therapist reduced falls particularly with people at high risk of falling (Cumming, Thomas, Szyonyi, & Salkeld, 1998; Frampton, Cumming, & Thomas, 1999). Differing viewpoints and meanings about a home (Christenson, 1990b), however, can make environmental modification difficult (Clemson, Cusick, & Fozzard, 1999; El Faizy & Reinsch, 1994). For instance, older people may remain reluctant to alter their homes unless they have experienced a fall (El Faizy & Reinsch, 1994). This suggests that home environmental change may not always be a possible falls prevention strategy (Clemson, Cusick et al., 1999; Schoenfelder & Van Why, 1997).

Community nurses are often the health professionals with whom older people living at home have most contact. A recent study in the United Kingdom by Willis (1998) identified that district nurses were the most likely group of professionals to screen older people (75 years and older) for the risk of falling. But what instruments do these nurses use to assess risk? Willis surveyed health centers or individual practitioners in six counties in England and Wales and found that 97% of the respondents did not use a tool. When tools were used, however, they were found to be unsuitable for assessing risk of falling within the home environment (Willis, 1998). A similar situation exists in Australia and possibly in other countries.

Community nurses undertake a comprehensive biopsychosocial assessment of the client and often rely on occupational therapists to undertake environmental assessments. Traditionally, assessment and modification of the home environment has been a specialized service delivered by occupational therapists (Clemson, 1997). The problem, however, is that the vast majority of older people do not come into contact with occupational therapists to receive this assessment and modification service (Bye et al., 1998). Most older people do not interact with occupational
therapists because occupational therapists are not available, the referral to occupational therapy is not made, or the referral is made too late (Bye et al., 1998). The lack of specialist occupational therapist service is often seen in rural areas, as evidenced in a recent study to develop a home hazards tool for rural communities (Laferriere, Palermo, Scribner, & Rutledge, 1998). As key coordinators of the health of older people, it is important that community nurses have the ability to assess environmental risk.

There are several home environment assessment tools available of varying measurement quality (Rodriguez et al., 1991). Many of these have been designed by and for occupational therapists, with specialist skills and knowledge in the area of environmental assessment, adaptation, and adjustment for people with special needs (Clemson, Roland, & Cumming, 1992, 1997; Cooper, Cohen, & Hasselkus, 1991; Reed & Sanderson, 1999). The most commonly used and widely available occupational therapy instrument in Australia is the Westmead Home Safety Assessment (WeHSA) (Clemson, 1997). This criterion referenced instrument has been examined for face validity, content validity, and reliability and it appears acceptable for clinical use (Clemson, Fitzgerald, & Heard, 1999; Clemson, Fitzgerald, Heard, & Cumming, 1999). The tool, however, is lengthy and requires specialist training and is therefore unsuitable for use by community nurses.

In addition to occupational therapy instruments, there are many checklists used in health promotion programs and falls research that present environmental features that may be considered a risk for falling, especially by older people. These may include lists: identifying rooms and spaces where falls can occur (Fleming & Pendergast, 1993), specific hazards in each room of the house (Josephson et al., 1991), “home safety inspection” (Thompson, 1996) and “home safety assessment,” (Plautz, Beck, Selmar, & Radetsky, 1996), and finally, of rooms, hazards, and behaviors of concern. The weakness of many of these instruments is that little or no information regarding the quality of these measures is presented in such checklists.

There are also a number of self-administered instruments that have been developed as health promotion tools. These require the respondent, usually assumed to be an older person, to identify listed hazards and check whether or not they are present or could be removed or changed. Some examples of self-administered tools include the Falls Prevention: Your Home Safety Checklist (New South Wales [NSW] Health, 1995) and the well known Home Safety Checklist (Kellogg International Work Group on the Prevention of Falls by the Elderly, 1987).

As nurses are key providers of direct care in the community, there is a need for an instrument, in addition to the wide range already available, which can be easily and quickly be administered by community nurses as part of their routine practice. Such an instrument can provide the information needed to identify home hazards requiring either targeted nursing action or referral for specialist occupational therapy assessment and home modification intervention. Similarly, hazardous home behavior that is amenable to nursing intervention can be identified and acted upon when necessary.

This study aims to develop a short instrument to be used by community nurses to identify features in the home environment that could be considered hazards to older people and behaviors that could be indicative of unsafe practices that could result in injury. This study will also examine the instrument’s construct validity and internal consistency.

**METHOD**

This study used secondary data analysis techniques to examine the validity and reliability of the Home-screen scale. The original data were supplied to the National Exceptional Case Co-Ordination Unit (a community nursing support system of the Commonwealth Department of Veterans’ Affairs [DVA]). This support service centrally manages information on a wide variety of veteran characteristics and nursing activities to generate funding levels and supply summary information to service providers and funding agencies on veterans with intense community nursing care needs and consequent cost. A subset of these data, collected by community nurses from April to June in 1998, was extracted in a de-identified form from the central database and used to undertake these analyses.

**Sample**

The sample consisted of 1,165 veterans receiving care from community nursing services of the DVA. Veterans came from any part of Australia including remote, rural, and metropolitan communities. The mean age of veterans was 81 years and 58% were male (see Table 1). Most veterans had low levels of dependency (863/1,166; 74%) with 46% having a coresident caregiver. Overall this sample reflected a group of clients with poor to fair health (929/1,112; 83.5%). The two principal medical diagnoses frequently occurring in this sample were stroke and osteoarthritis, although these were small in number. A diverse range of diagnoses applied to this sample (see Table 1).

**Instrument**

The Home-screen scale was specifically designed as a nurse-administered instrument to identify environmental hazards and unsafe behavior and alert nurses to the need for specialized environmental assessment and behavior change. A review of the literature revealed that a wide range of environmental features and home behaviors were...
TABLE 1. Subject Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years</td>
<td>1,165</td>
<td>80.77 (SD = 7.13)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td>Percentage</td>
</tr>
<tr>
<td>Male</td>
<td>674</td>
<td>57.8</td>
</tr>
<tr>
<td>Female</td>
<td>488</td>
<td>41.9</td>
</tr>
<tr>
<td>Self-rated health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>455</td>
<td>40.9</td>
</tr>
<tr>
<td>Fair</td>
<td>474</td>
<td>42.6</td>
</tr>
<tr>
<td>Good</td>
<td>157</td>
<td>14.1</td>
</tr>
<tr>
<td>Very good</td>
<td>21</td>
<td>1.9</td>
</tr>
<tr>
<td>Excellent</td>
<td>5</td>
<td>0.4</td>
</tr>
<tr>
<td>Activities of daily living</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High dependency*</td>
<td>303</td>
<td>26.0</td>
</tr>
<tr>
<td>Low dependency†</td>
<td>863</td>
<td>74.0</td>
</tr>
<tr>
<td>Carer availability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beneficiary independent or has no need for carer</td>
<td>66</td>
<td>5.7</td>
</tr>
<tr>
<td>No carer available</td>
<td>300</td>
<td>25.7</td>
</tr>
<tr>
<td>Has a co-resident carer</td>
<td>534</td>
<td>45.8</td>
</tr>
<tr>
<td>Has a nonresident carer</td>
<td>168</td>
<td>14.4</td>
</tr>
<tr>
<td>Lives in a mutually dependent situation</td>
<td>52</td>
<td>4.5</td>
</tr>
<tr>
<td>Not applicable/in residential care</td>
<td>39</td>
<td>3.3</td>
</tr>
<tr>
<td>Principal medical diagnosis (top 5 only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke/CVA—late effects – hemiplegia</td>
<td>148</td>
<td>12.7</td>
</tr>
<tr>
<td>Osteoarthritis—generalized, multiple sites</td>
<td>104</td>
<td>8.9</td>
</tr>
<tr>
<td>Airways obstruction—chronic</td>
<td>91</td>
<td>7.8</td>
</tr>
<tr>
<td>Malignant neoplasm</td>
<td>82</td>
<td>7.0</td>
</tr>
<tr>
<td>Ulcer, lower limbs</td>
<td>68</td>
<td>5.8</td>
</tr>
</tbody>
</table>

*High dependency was determined by using three items from the Community Nursing Minimum Dataset activity of daily living scale (ACCNS, 1994; 1997). High dependency occurs when the client is dependent (score greater than 1) in transfer and bathing/showering, dressing, or toileting.
†Low dependency was inferred when the client was independent (score of 1) in transfer, bathing/showering, dressing, or toileting.

included in tools designed to assess home hazards. The literature also revealed little information about what particular features and behaviors were predictive of falls. The investigators used their knowledge of community nurse activity, within the context of home visits, to identify features of the environment and home behavior that could be easily observed or would be readily known about community nursing clients. As the pilot instrument was specifically developed to be a short scale, the investigators kept the instrument limited in size.

Further deliberation by the investigators concluded that there was a need to avoid special training in a screening instrument, whilst retaining those home behaviors and features that could be readily observed by community nurses. Fourteen aspects were chosen by the investigators from the array of possible features and behaviors presented in the literature. These aspects formed the items in the new scale.

Seven environmental features formed the items included: room clutter, good lighting for day and night, floor coverings, shoes worn in the home, toileting, and showering facilities. Each item was rated from 1 to 10 with intervals of 1, with a score of 10 representing a home where every room was free of clutter.

Home behaviors important for safety and easily observed by nurses were also considered. Seven items were included in the home behavior subscale: the use of clean toilet facilities or aids, moving carefully through the house, wearing footwear correctly, taking care when doing things, night lighting when getting up, climbing to reach high items, and hurrying to answer telephone or door (reverse scoring applies). Similar scoring systems to that used in the home environment subscale were used. Total subscale scores ranged from 7 to 70.

Procedure

The Home-screen scale was included in a survey form that was completed by community nursing. This community nursing survey form included a range of areas such as: demographics, disease patterns, health rating, specific be-
behaviors (such as falling), nursing care requirements, social support, cognitive function, home environment and home behavior, and support services required (including home modification). This form is routinely completed by nurses in relation to their clients.

RESULTS

Psychometric assessment of the scale consisted of examining the construct validity and internal consistency of the instrument. Construct validity of the scale was determined using factor analytical techniques. These techniques gave an overall sense of how well the scale items (subsequently formed into factors or groupings of items) described an underlying latent construct: in this case Home-screen consisted of two subscales—Home-safe and Home-behavior. Each component of the Home-screen was examined separately.

Initial exploratory factor analysis and reliability assessment on 14 items suggested deletion of two items (“person climbs to reach high items” and “person hurries to answer telephone or door” [Home-safe]) because of low factor loading and low item to total correlation \( r = 0.21, r = 0.17 \), respectively. The remaining 12 items were analyzed using factor analysis and varimax rotation. Subsequent varimax rotation was then undertaken to assist in the interpretation of a possible 3 factor solution accounting for 66% of the variance of Home-screen. On close examination of the items, however, two additional items were loading on two factors (factor loadings > 0.40)—“toileting facilities and items are easy to reach and use at night” (from Home-safe), and “person uses stable, clean toilet facilities or aids” (from Home-behavior). After deleting these two cross-loading items, further analysis was suggestive of a configuration of 10 items within two factors. When principal components factor analysis was programmed to produce 2 factors to correspond to the predetermined 2 subscales of the instrument (home safe and behavior), it accounted for 60% of the variance (see Table 2) and demonstrated a two factor solution on scree plot. Examination of the factor matrix showed one item loaded more appropriately on the Home-behavior subscale than the originally designed Home-safe subscale: “shoes usually worn at home fit well and have good traction on heels and soles” (home-safe). The best factor solution appears in Table 2 and includes the relocation of the above item. Table 2 highlights the high factor loadings (0.65–0.81) for all items.

Differences in Known Groups

Another approach to confirming the underlying construct is to examine differences in the instrument with groups that would be perceived as likely to differ on the scale. In this case, the item relating to transfer from the Community Nurs-

ing Minimum Data Set Australia (Australian Council of Community Nursing Services, Inc. [ACCNS], 1997) was used to distinguish older people requiring assistance with transfer and those not requiring assistance (no assistance required in transfer [1] or physical assistance required [2]). All clients with a complete set of scores for the Home-screen scale and dependency transfer item \((N = 989)\) were grouped into independent on transfer \((n = 752, \text{Group 1})\) and dependent on transfer \((n = 237, \text{Group 2})\). An independent \( t \) test, with equal variances not assumed, was then undertaken confirming that there was a significant difference between the groups \( t = 4.5 \) \([df = 323.1] \ p < 0.001\) \((\text{Group 1}: M = 82.14, SD = 15.56; \text{Group 2}, M = 75.54, SD = 20.83)\). Nonparametric procedures were also used, as these data were not normally distributed, and similar results were obtained.

Reliability (Internal Consistency)

The reliability of the overall scale and subscales, known as internal consistency, was determined using Cronbach’s alpha. This statistic was calculated separately for the items comprising the 2 factors and for the entire scale. The resultant alpha coefficients were: 0.84, Home-safe subscale (5 items); 0.81, Home-behavior subscale (5 items); and 0.86 for all items or Home-screen. (Table 2).

Critical Points: Potential for Falls and Injury in Older People

Using the best solution (10 items), the distribution of the total scores for the total Home-screen scale and total Home-safe subscale and total Home-behavior subscale were calculated. The investigators aimed to produce an instrument that would prompt nurses to act on home environment or home behavior hazards either by seeking assistance from occupational therapists or by implementing targeted nursing interventions where such specialist services were not available. To provide a prompt for action by nurses using the scale, a score on the total home-screen scale was sought that would indicate the need for intervention. This was considered to be a critical point on the scale that reflected a threshold of risk.

By using these total scores at the 25th percentile, the score for the Home-screen scale was 71. This means that only 25% of this entire sample (247/989) had a score of 71 or less, representing poor home safety and behavior. Similarly, the 25th percentile score was 36 for the Home-safe subscale and 33 for the Home-behavior subscale. Percentiles, rather than a derived score, have been chosen as the mean scores for the items, and therefore scales are generally high. It is also notable that 50% or more of this sample had a total Home-screen score of 84.

Further confirmation of the utility of the critical point of 71 was sought by exploring the association between
TABLE 2. Characteristics of Items in Home-Screen Best Solution: Principal Component Analysis Using Varimax Rotation Method with Kaiser Normalization for Two Factors Using Ten Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>SD</th>
<th>ITc</th>
<th>Factor 1</th>
<th>Factor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Home-safe</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rooms/halls are free of clutter</td>
<td>7.89</td>
<td>2.59</td>
<td>0.67</td>
<td>0.78</td>
<td>0.16</td>
</tr>
<tr>
<td>Rooms/halls have good daylight</td>
<td>8.10</td>
<td>2.39</td>
<td>0.70</td>
<td>0.84</td>
<td>0.11</td>
</tr>
<tr>
<td>Rooms/halls have good night lighting</td>
<td>8.34</td>
<td>2.27</td>
<td>0.72</td>
<td>0.82</td>
<td>0.20</td>
</tr>
<tr>
<td>Floor coverings in home are even, firm, and nonslip</td>
<td>8.36</td>
<td>2.28</td>
<td>0.63</td>
<td>0.76</td>
<td>0.17</td>
</tr>
<tr>
<td>Bathing/showering facilities and items are easy to access and use</td>
<td>8.36</td>
<td>2.38</td>
<td>0.50</td>
<td>0.60</td>
<td>0.34</td>
</tr>
<tr>
<td><strong>Home-behavior</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Person moves carefully through the house</td>
<td>8.04</td>
<td>2.58</td>
<td>0.67</td>
<td>0.20</td>
<td>0.81</td>
</tr>
<tr>
<td>Person wears footwear correctly</td>
<td>7.78</td>
<td>2.99</td>
<td>0.67</td>
<td>0.23</td>
<td>0.75</td>
</tr>
<tr>
<td>Person takes care when doing things at home</td>
<td>7.86</td>
<td>2.67</td>
<td>0.65</td>
<td>0.14</td>
<td>0.81</td>
</tr>
<tr>
<td>Person puts lights on at night if getting up</td>
<td>8.19</td>
<td>2.99</td>
<td>0.44</td>
<td>0.01</td>
<td>0.65</td>
</tr>
<tr>
<td>Shoes usually worn at home fit well and have good traction on heels and soles</td>
<td>7.62</td>
<td>3.00</td>
<td>0.58</td>
<td>0.31</td>
<td>0.65</td>
</tr>
</tbody>
</table>

ITC = Item-total correlation.

Home-safe subscale: Cronbach’s alpha = 0.84 (5 items).

Home-behavior subscale: Cronbach’s alpha = 0.81 (5 items).

Overall cumulative variance explained for all items and Home-screen scale was 60% with a Cronbach’s alpha of 0.86. Scree plot demonstrates 2 components with an eigenvalue of greater than 1.

veterans with low (scores of 71 or less on the Home-screen scale) and high (scores greater than 71) home safety and behavior, and veterans experiencing falls. An item referring to falling behavior: “does the beneficiary experience falling behavior” (response never [1], rarely [2], occasionally [3], frequently [4]) was used to form two groups: Group 1, scores of 3 or less and Group 2, scores of 4. Chi-square analysis demonstrated that veterans with poor home safety and behavior (scores of 71 or less on Home-screen) also experienced frequent falls (χ² = 15.4, df = 1, p < 0.001, n = 726). Also it is notable that 74.2% (539/726) of veterans had a score of more than 71.

It was also possible to use this critical point to form groups of high and low Home-screen scorers and compare these with the proportion of veterans perceived by community nurses to require “support services used or planned—home modification.” Chi-square analysis demonstrated that a slightly higher proportion of veterans with poor home safety and behavior (scores of 71 or less on Home-screen) were also identified as needing or having home modification service, although this was not significant at the 0.05 level (χ² = 2.0, df = 1, p = 0.097, n = 989). Further analyses were undertaken using a higher critical point of 74 to split the groups. These analyses resulted in a statistically significant difference (χ² = 4.15, df = 1, p = 0.047, n = 989), with higher proportions of veterans with high Home-screen scores (scores of greater than 74) being perceived as not requiring home modification services and higher proportions of veterans with low Home-screen scores (scores of 74 or less) being perceived as requiring home modification services.

**DISCUSSION**

Health promotion in older people remains an important and developing role for public health nurses (Davis, 1994). Falls prevention and tools that assess the potential for falls, should be included in any comprehensive nursing assessment of community-living older people (Lange, 1996; Moss, 1992; Williams & Nolan, 1993). This study sought to develop and test a short screening tool that could be used by community nurses to assess home environments and home behavior that may constitute a risk for falls. This research fills a gap in the nursing literature (Willis, 1998). The Home-screen was designed to prompt nurses to act on these risks through referral to specialist services such as occupational therapy and targeted nursing interventions to reduce the hazard. These interventions could replicate or extend nursing falls prevention programs already presented in the literature (Mah, 1996; Ploeg et al., 1994; Schlapman, 1990; Schoenfeld & Van Why, 1997; Tidek-saar, 1989; Weber, Kehoe, Bakoss, Kiley, & Dzigiel, 1996).

We acknowledge that more comprehensive home hazards assessment tools exist, in particular the WeHSA (Clemson, 1997), but these tools require specialist professional skill and considerable time to complete.

This sample of older community-living Australians represent a group of older men and women with high functionality and mainly fair or poor health; a group of older people susceptible to falls.

The primary aim of this study was to examine the quality of the instrument through psychometric investigation of the validity and reliability of Home-screen. The final solu-
tions—10 items (5 for Home-safe, 5 for Home-behavior)—explained 60% of the concept of home safety and home safe behavior, confirming adequate construct validity (Hair, Anderson, Tatham, & Black, 1992). The results revealed that the 14-item scale was improved if four items were deleted, and if one item (relating to shoes) was moved from the Home-safe subscale to the Home-behavior subscale. For the latter, some modification to the item is recommended to allow it to be consistent with the Home-behavior scale, that is: “Person wears shoes at home that fit well and have good traction on heels and soles.”

Construct validity of the instrument was further explored through examination of differences in known groups using independence and dependence on transfer as a grouping variable. This item was selected as ability to transfer has been previously identified as a risk factor for falls (McLean & Lord, 1996; Ray et al., 1997), and may also be considered an indicator of mobility (an important issue in falls prevention). Veterans who could transfer independently had higher mean scores than those who could not and this difference was statistically significant, demonstrating that the Home-screen could appropriately differentiate between the groups.

Internal consistency (a form of reliability) was also explored, and confirmed with alpha coefficients ranging from 0.81 (Home-behavior), and 0.84 (Home-safe), to 0.86 for Home-screen total scale—well within acceptable levels (Nunnally, 1978).

The Home-screen was designed to act as a screening instrument to prompt nurses to reduce falls through attention to well documented extrinsic risk factors of home environment and home behavior. Consequently, it was important to identify a critical point that reflected a threshold of risk in relation to these areas. “Thresholds” of risk have been identified to be an important dimension of falls prevention (Wolter & Studenski, 1996). This is important because the multifactorial nature of falls means that intervention that targets any one area or factor may have limited effect if it does not lower the overall threshold of fall risk (Wolter & Studenski, 1996).

An attempt to derive such a point was made based on the score representing the 25th percentile (71). Findings from the analyses of veterans’ Home-screen scores, using a score of 71 or less (an older person at risk) and those with a score of more than 71, found an association between the groups of low and high scorers and frequent and infrequent falling behavior. Here it was apparent that frequent fallers could be distinguished from others in the sample on the basis of score (71 or less) on the Home-screen. This is not surprising, given the role that home environment and behavior have in fall risk (Connell & Wolfe, 1997).

Similar analyses were undertaken using the same groupings and community nurses perceptions that home modification services were required or not required. These analyses were not statistically significant at the 0.05 level using a score of 71, but were significant when a score of 74 was used as the splitting point for low and high scorers.

From these preliminary analyses it would seem that there is support for the statement that a score of 74 or less should be an indicator to the nurse of a need to seek specialized services, if available, or to immediately initiate an education program. This threshold score, or critical point, is quite high. This is not surprising given that the sample live independently in the community and have high functionality. Consequently, the scale does have a high mean item score and therefore high overall score, which results in a high threshold value. Clinically, this high scoring (or threshold value) is important to note as community nurses, who can be faced with a wide variety of living conditions of their clients, need to recognize that a home environment that is superficially comfortable and acceptable, may hold safety risks that require attention to detail beyond matters of cleanliness and comfort.

A short screening tool that assesses home safety and home safe behavior in community-living older people has been developed and found to be both valid and reliable. Previously, the lack of appropriate community nursing tools in the area was a problem, and may have contributed to the high number of nurses who did not use an instrument of any kind to assess this fall risk (Willis, 1998). The Home-screen scale could easily be incorporated in the initial assessment of a client as it is short, requires no special training, and relies upon knowledge gained through routine practice with the client in the home. This instrument could also be used as a monitoring tool to assess changes in behavior and the environment following education or home modification programs.

Further research is required in a number of areas. First, there is a need to explore predictive validity testing to confirm that this instrument is predictive of injury and falls in older people or the examination of specific high risk subgroups. Second, the development of an administration manual that would include the provision of structured definitions for key terms such as “clutter” to assist raters and ensure increased consistency is required. Third, further investigation is required into the nature of the items themselves, in particular, the interrater reliability of the overall scale, subscale, and items. Ultimately, the clinical success of assessments such as the Home-screen is the ability of the nurse to use the information to successfully encourage change by the older persons to make their homes safer. More research is required to understand why such change is difficult to achieve (Clemson, Cusick et al., 1999; Schoenfelder & Van Why, 1997).

Public health nurses have an important role to play in falls prevention and the use of the Home-screen scale pro-
vides these nurses with a valuable tool to heighten awareness, frame intervention programs, seek specialized help where available, and confirm successful actions when enacted. Making the home safe for older people not only reduces older people’s morbidity and mortality, but also adds to their quality of life by reducing their fear of falling.

**REFERENCES**


